WHAT IS CLAIMED IS:

1. A gas distribution face plate comprising:

a face plate body having a thickness defining a number of inlet orifices having a width and a depth, at least one of the number, the width, and the depth configured to create a uniform pressure drop of between about 0.8 and 1 Torr across edge and center regions of the faceplate as gas is flowed through the inlet orifices, whereby a thickness of material deposited at an edge of a wafer varies by 3% or less from a thickness of material deposited at a center of the wafer, when the wafer is separated from the face plate by a gap of between about 75 and 450 mils.

2. The face plate of claim 1 wherein the orifice width comprises between about 0.010" and 0.018".

3. The face plate of claim 1 wherein the number comprises between about 2000 and 17500 orifices.

4. The faceplate of claim 3 wherein the number comprises about 10000 and the face plate is configured to process a wafer having a diameter of about 300 mm.

5. The faceplate of claim 3 wherein the number comprises about 5000 and the face plate is configured to process a wafer having a diameter of about 200 mm.

6. A method of depositing on a semiconductor wafer, a layer of material having a center-to-edge thickness variation of 3% or less, the method comprising:

providing a gas distribution faceplate having a thickness and defining a number of inlet orifices having a width and a depth, at least one of the orifice number, width, and depth configured to create a uniform pressure drop of between about 0.8 and 1 Torr as gas is flowed through edge and center regions of the faceplate;

providing a semiconductor wafer separated from the gas distribution faceplate by a gap; and

flowing a gas through the faceplate body and across the gap to deposit the layer of material on the wafer.

7. The method of claim 6 wherein the semiconductor wafer is provided at a gap of between about 75 and 450 mils.

8. The method of claim 6 wherein the faceplate body is provided with orifices having a width of between about 0.010" and 0.018".

9. The method of claim 6 wherein the face plate body is provided with between about 2000 and 17500 orifices.

10. The method of claim 9 wherein a 300 mm diameter wafer is provided, and the faceplate is provided with about 10000 orifices.

11. The method of claim 9 wherein a 200 mm diameter wafer is provided, and the faceplate is provided with about 5000 orifices.

12. A method of promoting deposition of material of uniform center-to-edge thickness on a semiconductor wafer, the method comprising:

constricting a flow of deposition gas through a gas distribution faceplate, such that a resulting pressure drop across the faceplate creates a low pressure region over a wafer, gas velocities in the low pressure region over a wafer center and a wafer edge sufficiently uniform to result in deposition of a layer of material having a center-to-edge thickness variation of 3% or less.

13. The method of claim 12 wherein the resulting pressure drop is between about 0.8 and 1.0 Torr.

14. The method of claim 12 wherein the semiconductor wafer is provided at a gap of between about 75 and 450 mils from the faceplate.

15. The method of claim 12 wherein the deposition gas flow is constricted by faceplate orifices having a width of between about 0.010" and 0.018".

16. The method of claim 12 wherein the deposition gas flow is constricted by faceplate orifices numbering between about 2000 and 17500.

17. The method of claim 16 wherein the deposition gas flow is constricted by about 10000 orifices and the material is deposited on a 300 mm diameter wafer.

18. The method of claim 16 wherein the deposition gas flow is constricted by about 5000 orifices and the material is deposited on a 200 mm diameter wafer.